EPA New England | Center for Environmental Industry & Technology

TECHNOVATION

CURRENT NEWS AND EVENTS ON INNOVATIVE ENVIRONMENTAL TECHNOLOGIES • SPRING 1997

Welcome to EPA New England's fifth edition of Technovation. In this issue, we are highlighting seven companies that participated in our most recent Environmental Venture Capital Forum. For those of you who missed the event, here is your opportunity to learn about the presenting companies.

EPA's Center for Environmental Industry and Technology (CEIT) sponsors Environmental Venture Capital Forums in an effort to spur the introduction of new, cost-efficient technologies into the marketplace. The forums provide technology developers with an opportunity to present their products and business plans to investors. They differ from other forums in that EPA officials are on hand to answer questions about relevant rules and regulations.

Working with the MIT Technology Capital Network and the Environmental Business Council of New England on our most recent event, a New England-wide solicitation was released to prospective presenters. We were extremely pleased with response to the solicitation and the quality of companies interested in presenting at the forum.

Companies were selected by an inter-organizational committee based on the phase of funding being sought, quality of plan, technical focus, and environmental applicability. If you would like to know more about the event or are interested in presenting at future forums, please call Jim Cabot, Carol Kilbride, or JoAnn Vizziello of CEIT at 1-800-575-CEIT.

TECHNOLOGY SHOWCASE Inside

Why We're Bullish on Envirotech!

Our main mission at the Center for Environmental Industry and Technology (CEIT) is to help smooth the way for new environmental technologies entering the marketplace. To do this, we work with a variety of players ranging from university research professors to large institutional investors. We converse with financial, regulatory, and business experts, manage numerous projects, and work directly with hundreds of technology developers.

Although we are not financial advisors, this broad perspective has enabled us to gain certain insights and pull together some observations that might surprise people. We have found that despite the relatively poor performance of the environmental sector over the last few years, there are a number of reasons to be optimistic.

First the bad news:

The common understanding of the environmental industry runs as follows: In the 1980's, envirotech was seen as a hot market because companies were perceived to have guaranteed markets—locked in by the "demand" of environmental regulations and backed up by EPA enforcement. Expected growth was supposed to rival that of biotech, software development, and telecommunications.

As we entered the recession of the early nineties, however, it quickly became apparent that regulations did not guarantee customers. In fact, regulations often inhibited the adoption of new technologies. Long approval times, inconsistent enforcement, and cut backs in corporate budgets were often the death blow for emerging technologies. The environmental industry went from being regarded as "recession proof" to susceptible to a "double whammy" effect; i.e., as corporate budgets tighten, so do enforcement budgets and political willingness to crack down on violators. Just as importantly, investors began to realize that parallels to biotech, communications, and software start-ups were not applicable because the potential markets for envirotech were much more limited and fraught with perils not found in the other sectors. Unfortunately, even as we slowly moved out of the recession of the early nineties, the stigma attached to the environmental industry remained.

So what's the good news?

Because many investors would not look at environmental deals due to the associated regulatory risks, entrepreneurs, researchers and regulators have changed their approach. EPA began to realize that many of our command and control regulations promoted technology lock-in. Hence, we began moving towards a more flexible regulatory structure, shifting environmental technology decision making out of regulatory offices and into the regulated community where it belongs. Envirotech start-ups are also becoming more sophisticated. The lessons of the last recession were well learned by today's entrepreneurs. It is now rare to find a business plan that relies solely on regulatory drivers. Instead, plans focus on economic benefits and adding

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Black Dust to Gold Dust

Scott Erickson, President of **Erickson Materials, Inc. (EMI)**, plans to turn black dust into "gold dust" with the production of recycled rubber powder made from scrap tires and industrial rubber waste. According to Erickson, **EMI**'s proprietary and potentially patentable technologies make it possible to reduce waste rubber to a powder the consistency of dust.

EMI's rubber powders can be used in a variety of products including molded and extruded rubber and plastic goods, automotive tires and rubber modified asphalt. Some of **EMI**'s materials will be chemically treated using a proprietary enhancement process that will increase their ability to bond with other materials and render them suitable for new applications.

EMI believes it can produce and sell products for a fraction of the cost of the materials they will be replacing. Company research data suggests that a typical manufacturer can save up to 15% in raw material costs using **EMI**'s powders to replace or displace a percentage of more expensive virgin rubbers and plastics.

EMI's immediate goal is to build a pilot plant featuring its "Superfine" technology. The next step would be a full-scale manufacturing facility in the metropolitan Boston area capable of producing 40 million pounds of powder annually. At full operation, the plant is anticipated to generate revenues of $12 million per year with a net income before taxes of approximately $6 million.

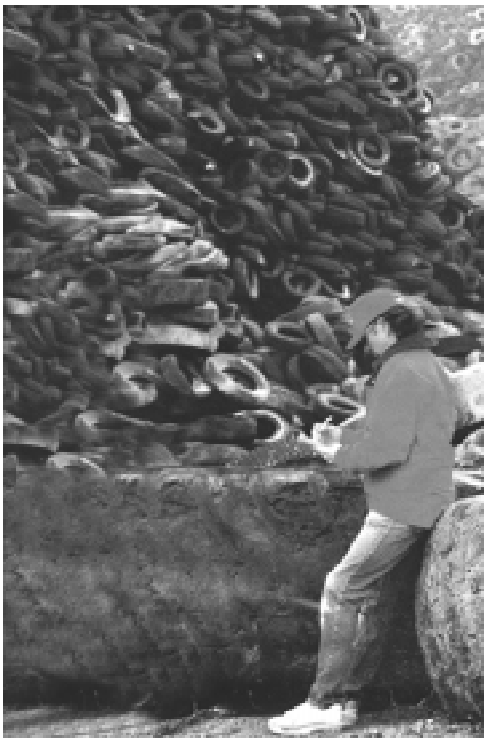
The company is currently looking for a $450,000 investment in the form of equity capital to construct the pilot plant. Once the full-scale facility is up and operating as anticipated, the company expects to develop five additional plants in Ohio, California, Florida and two Pacific Rim countries.

For more information contact:

Scott Erickson, President
Erickson Materials, Inc.
79 Shore Drive
Winthrop, MA 02152

tel (617) 539-4800
fax (617) 539-4929

Each year Americans generate about 250 million scrap tires. An estimated one billion can be found in piles like these.



One Person's Trash, Another Person's Treasure

Finding a profitable reuse application for a particular type of recycled plastic is easy. Finding one for an agglomerate of indiscriminately mixed scrap plastic further "contaminated" by paper, metal, rubber, wood, and dirt is not. **ATlon Laboratories** has done so however, and plans to turn trash into treasure by molding large items (from 10 to 100 pounds each) from mixed plastic scraps that no one else seems to want.

According to Bob Mann, President of **ATlon**, the company has developed a proprietary process, the ATlon Planar Process (APP), comprised of innovative cost-optimizing technologies and procedures capable of producing a variety of products. The feedstock used in the manufacturing process would only need to be grossly shredded. It would not have to be sorted, washed, pelletized, or otherwise handled.

ATlon is seeking to establish a worldwide network of independent manufacturing "nodes" that will utilize APP technologies and procedures. The geographically separated nodes would strive for symmetry in use of locally-generated source materials and local sales of end products. This would minimize shipping costs at both ends of the line.

Although capable of producing a variety of products, the company has chosen industrial shipping pallets and skids for its initial product area. Currently, these products are made from wood or virgin plastic. Source materials would come from industrial, consumer, and institutional waste streams with particular attention to the "ugly stuff" (mixed polymers, foams, and laminated materials). Based upon company research, the competition is thought to consist of over 4,000 wood pallet assemblers and less than 10 plastic (virgin stock) molders. There are no dominant pallet/skid suppliers to dictate standards or prices.

The company is approaching the end of its start-up phase and is currently building its first pre-production Node in Framingham, Massachusetts.

ATlon is capitalized with 500,000 shares of common stock. To date it has been financed by the founders. The company is offering shares for sale at $10.00/share in U.S. dollars.

For more information contact:

Bob Mann, President
ATlon Laboratories, Inc.
82 R Herbert St.
Framingham, Massachusetts 01702

tel (508) 875-4421
fax (508) 875-4421

Now You See It, Now You Don't

Move over David Copperfield, you're not the only one who can make things disappear. **Imagex Technologies, Inc.** is engaged in the design, development, manufacture and marketing of proprietary office products and machine technologies that allows businesses to reuse discarded paper and paper products. They are currently focused on developing a product that will clean or "decopy" photocopied and laser printed paper for reuse. The product, expected to be about the size of an average office copier, will be marketed as the Office Paper Decopier (the Decopier).

According to company president Sushil Bhatia, three distinct markets exist for the decopier. The first includes universities and schools, businesses, and government offices. The second market targets businesses producing recycled paper. The Decopier could provide an efficient and low-cost means for paper mills to remove toner from paper during the recycling process.

The third takes a different approach with the product being marketed as an effective means to maintain the security of classified and confidential documents. Presently, shredding or tearing paper is the most common means of maintaining security of confidential documents. By "erasing" unwanted classified documents, the Decopier could provide a much more secure means of destroying documents, with the added benefit of creating a clean sheet of paper for immediate reuse.

The cost of the Decopier is expected to range from $3,000 to $5,000. Based upon initial company research, Bhatia believes that a medium-sized business using the Decopier could expect to recover its cost in one year. A smaller company, using two reams, or a thousand sheets of paper per day, could expect to recoup its cost for a smaller machine in about eighteen months. Once the Decopier is installed, the company expects that the sale of supplies (cartridges) and service maintenance contracts would provide an additional stream of company revenue. A patent application for the Decopier technology has already been filed by **Imagex** and is being aggressively pursued. (David Copperfield doesn't share his secrets either.)

For more information contact:

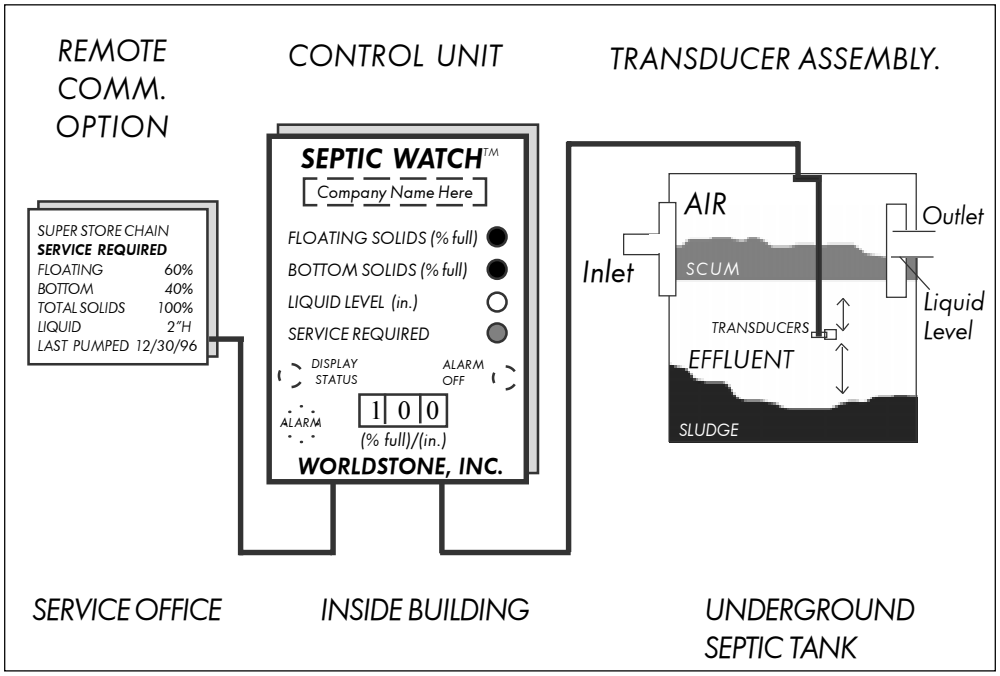
Sushil Bhatia, President
Imagex Technologies, Inc.
59 Fountain St.
Framingham, MA 01701

tel (508) 626-2775 or
(508) 620-0421
fax (508) 620-7563

Look Ma, No Hands

WORLDSTONE, Inc., headquartered in Sandwich MA., was founded in 1994 to address the need for a simple, reliable, and cost-effective method for monitoring the status of on-site septic systems. The Company has developed a Septic Tank Monitor that continuously inspects the critical conditions inside a septic tank or commercial grease trap and provides a status of those conditions to a small box provided with a display and alarm conveniently located inside the home or business. Owners can determine the status of their septic tank at any time and will be alerted when it needs to be serviced (pumped), is leaking, or is beginning to back up.

According to James Russell, Founder,



Total Management of On-site Septic Systems

* Disclaimer: EPA has not examined any technology and does not endorse or recommend any product, company, or security which may be offered for sale by companies featured in this publication. Furthermore, EPA has not confirmed the accuracy or legal adequacy of any disclosures, product performance or other information provided by the companies and used by EPA in production of this publication. All investors are encouraged to seek legal and other professional counsel prior to making investments in these businesses.

President, and CEO, the system employs state-of-the-art ultrasonic transducer technology combined with microprocessor-based software to accomplish its tasks. Since the Septic Tank Monitor does not impact the performance of a septic system, regulatory approvals are not required. Regulatory testing and recommendations are being solicited, however, to help smooth widespread acceptance of the product.

There is growing public awareness of the potential problems associated with failing septic systems. This awareness, Russell believes, has created a substantial market opportunity for effective, user-friendly tools for managing these systems.

The monitor would be marketed for both residential and commercial applications. Company research found that there are 27 million residential septic systems in the U.S. and an estimated 50 million worldwide. The commercial market is thought to include at least 1.25 million septic systems plus more than 200,000 grease traps, all of which are serviced more than once a year, and in many cases monthly or bi-weekly. The economic payback to businesses can be substantial, since maintenance costs and failure penalties are extremely high, especially at restaurants and supermarkets.

WORLDSTONE is currently seeking equity financing to enable the Company to fully complete the development and testing of the monitors.

For more information contact:

James M. Russell, President
WORLDSTONE, Inc.
134 Route 6A
P.O. Box 1070
Sandwich, MA 02563

tel (508) 888-6161
fax (508) 888-6262

Ready, Set, Go!

Gentleman (and ladies) start your ignitions! **Adrenaline Research Inc.**, a six-year-old R&D company has entered the race to create and commercialize an intelligent ignition and control system. The "Dual Energy Ignition" (DEI) will optimize gasoline and natural gas engine performance in terms of exhaust emissions, combustion efficiency, and fuel economy. With two European customers testing the DEI system, the company has not only entered the race, it has taken the lead.

Ed VanDyne, Founder and President of **Adrenaline Research**, patented the DEI technology after discovering a match between strobe light technology and ignition research done at the Massachusetts Institute of Technology. DEI uses a microprocessor-controlled, variable spark energy system to optimize combustion over a wide range of operating conditions throughout the life of the engine. According to VanDyne, a significant feature of DEI is its ability to dramatically reduce harmful exhaust emissions from gasoline and natural gas engines of all sizes. In fact, VanDyne reports that independent tests done on the technology installed in a Dodge Neon showed results demonstrating a 51% reduction in carbon monoxide and an 11% reduction in hydrocarbon emissions. VanDyne believes that integrating the combustion feedback from the Duel Energy Ignition with the vehicles's own engine computer will reduce hydrocarbon emissions another 10%-20%.

While there are several smaller markets, the company's primary target is automotive OEMs—original equipment manufacturers. To penetrate the automotive market, **Adrenaline** has formed a strategic alliance with a major industry supplier and has established relationships with all the major car companies. The DEI is the only ignition technology developed independently of the Big Three being tested by the USCAR consortium. The consortium was created by the U.S. Government and the three U.S. car companies to test the most promising new technologies for the automotive industry.

At this time, the company is seeking a small investment to accelerate the testing and commercialization of DEI.

For more information contact:

Ed VanDyne, President
Adrenaline Research, Inc.
3 Brent Drive
Hudson, MA 01749

tel (508) 568-8770
fax (508) 568-8786

Adrenaline Research Test Vehicle, in front of the engine test facility

There's Nothing Clever to Say About the Regeneration of Activated Carbon, But That Doesn't Make It a Bad Idea.

EcoSolve, L.L.C. was formed in 1995 to introduce advanced environmental electro-technologies and services to commercial customers in the U.S. and international markets. **EcoSolve** intends to invest in the development and acquisition of technologies that provide enhanced process efficiencies, provide for the capture, recycle and reuse of process by-products, and reduce or eliminate pollution to meet compliance limits.

The company is currently focussed on its ElectroSolv® technology, which regenerates activated carbon used in emission control and solvent recovery from gas streams. Through the direct electrical heating of activated carbon, ElectroSolv® can provide significant cost savings and energy efficiency advantages over existing forms of activated carbon regeneration and solvent recovery.

Invented by Foster-Miller, Inc. of Waltham, MA, the technology has been under development since 1991 with over $2 million invested in lab-, bench-, and pilot-scale testing. Foster-Miller owns a majority interest in **EcoSolve** and provides the technology, engineering, and development expertise. Two U.S. patents have been issued and international patents have been applied for.

The ElectroSolv® technology is being brought to commercial scale in forms that will serve three primary VOC markets: process plant gas treatment; landfill gas cleaning; and soil/groundwater remediation. To date, **EcoSolve** and Foster-Miller have been successful in enlisting government, industry, and electric utility support for demonstration projects.

EcoSolve has an active technology development and enhancement program underway with additional products planned for commercialization over the next several years. The company is seeking new capital to accelerate commercial demonstrations, develop new products, and initiate marketing and sales.

For more information contact:

Michael Scholtens
EcoSolve, L.L.C.
350 Second Avenue
Waltham, MA 02154-1196

tel (617) 622-3976
fax (617) 890-4084

From A to Z(ENTOX)

ZENTOX is a newly formed Boston corporation with the capability to develop, manufacture and market products for solving air, water and soil pollution problems. This company combines the resources of International Technology ("IT") Corporation's "NEPCCO" Equipment Division and IT Corporations's Advanced Technology in Photocatalytic Oxidation ("PCO") with the assets of PHOTOX, a Boston based research firm with a strong intellectual property position in proprietary catalysts and processes for advanced oxidation applications. In addition, **ZENTOX** has acquired a license for important photocatalytic oxidation technology from PHOTOCATALYTICS, Inc. of Boulder Colorado.

Company CEO Richard Svrluga explained that the combined assets will allow **ZENTOX** to exclusively manufacture and market new technologies in the fields of groundwater remediation, industrial water treatment, and treatment of contaminated vapor streams for environmental and industrial application. In order to capitalize on the industry image and brand recognition that NEPCCO has achieved over the past ten years, the NEPCCO name will be retained and the company will sell industrial equipment through its NEPCCO Environmental Systems Division. PHOTOX will continue its focus on applied catalyst and process research with a special emphasis in the area of photocatalytic oxidation for indoor air markets and other medical and consumer applications.

For FY 1997, **ZENTOX**'s projected market will consist of 85% commercial and 15% government accounts. The Company is seeking equity financing consistent with the Stock Purchase Agreement between IT Corporation and Photox. Investment during FY 1997 will be required for continuing development of indoor air quality systems and other new products.

For more information contact:

Richard Svrluga, CEO
Zentox Corporation
31 Milk Street Suite 510
Boston, MA 02109

tel (617) 542-0531
fax (617) 451 3322

ECN Receives Grant

EPA Region 1, New England is proud to announce that we have issued a grant to the Environmental Capital Network (ECN) based in Ann Arbor, Michigan. The grant will allow ECN to include New England companies in their Business Plan Review Service and will help defray the costs for participating companies. Pollution prevention companies looking for help with their business plans should contact ECN at (313) 996-8387.

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value for the customer.

We have also seen change within the research community. Universities are working with industrial partners more often to increase the odds for commercial acceptance of new technologies. Just as importantly, researchers are also working with regulators at an earlier stage, thereby avoiding regulatory problems that could emerge later.

International markets also offer great growth opportunities for envirotech companies. While domestic growth is expected to continue at a modest pace, many areas of the world are expected to see growth rates in the double digits.

International efforts conducted over the last several years are beginning to pay off, providing abundant envirotech opportunities. We at EPA have seen a dramatic increase in the number of foreign officials coming to New England to learn about our environmental solutions. The New England envirotech market is gaining a good international reputation.

Although launching a successful envirotech company still has many challenges, we are optimistic about the future of the industry. Investors are beginning to rediscover the sector, entrepreneurs are taking a new, more economic approach, and regulators are more sensitive to the need for flexibility in order to promote the adoption of new technologies. The combination of these three developments should help to ease many of the difficulties that have plagued the envirotech market in recent years. Finally and perhaps most persuasively, although the environmental sector has many unique factors, it, like any other industry, is still governed by the age old adage "buy cheap, sell dear." Many sophisticated investors are taking a second look at envirotech as potential deals in other sectors are perceived as too expensive. And, what they (and we) see is encouraging.

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EPA Region I - New England
JFK Federal Building (SPI)
Boston, MA 02203-0001

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